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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,165	11/29/2000	Jose Geraldo Furtado Ramos	2764-34	8558

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EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,165	RAMOS ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 29 November 2000 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 01/31/01 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings and Specification

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings and specification have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware.

Claim Objections

4. Claim 3 is objected to because of the following informalities: it is suggested by the Examiner to change the term "band" to -- range -- for clarity in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear as to where the body of the claim begins, as the claim lacks a transitional term indicating the division between preamble and body. Furthermore, "the solids" (line 3), "the said combined solids" (line 4) and "said single leg" (line 5) lack proper positive antecedent basis. Furthermore, the phrase "a single leg termination of the long-radius-curve type" (lines 5-6) is considered vague and indefinite, since "long" is a relative term and "type" renders the claim indefinite because the claim includes elements not actually disclosed (i.e., those encompassed by "type"), thereby rendering the scope of the claim unascertainable. Also note usage in subsequent claims.

Regarding claim 2, the term "the long-radius curve termination" lacks proper positive antecedent basis. Also, "long" renders the claim vague and indefinite, as it is a relative term.

Regarding claim 3, it is unclear as to which radius and to which diameter of the structural elements the claim is directed (i.e., the radius of curvature, diameter of the pipe, etc.).

Regarding claim 5, "the descending mass flow of dense phase solids" (lines 3-4) lacks proper positive antecedent basis.

Regarding claim 6, "the inlet" (line 2), "the curved termination" (line 2), "the junction" (line 2), "the discharge end" (line 3) and "the curve" (lines 3-4) each lack proper positive antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones (U.S. 2,634,191).

Regarding claims 1 and 2, Jones (FIG. 1-3) discloses, "Solids removed from the effluent gases by the cyclones are retuned through a pipe to the fluid bed. This pipe, commonly called a 'dip-leg,' *extends below the surface of the bed* in order to provide a seal against gases which might otherwise be blown upwardly in the dip-leg and prevent proper action of the cyclone. In some installation *cyclones in multiple are used discharging solids into a common dip-leg.*" (emphasis added; column 1, lines 32-48). Additionally, Jones discloses, "It is *desirable to terminate dip-leg* **16** *with a bend* **20** to act as a baffle against bubbles of air rising through the catalyst bed," (emphasis added; column 4, lines 36-39), wherein bend **20** substantially comprises a "termination of the long-radius-curve type".

Instant claims 1 and 2 structurally read on the apparatus of Jones.

7. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Baumann et al. (U.S. 3,353,925).

Regarding claim 1, Baumann et al. (FIG. 1) disclose a system which joins the lower end of the leg **122/132** of a secondary cyclone **118/128** and a leg **106** of a primary cyclone **104** to form a single primary and secondary cyclone leg complex (see Figure) where the solids collected by the cyclones are combined, characterized by the combined solids being simultaneously discharge from the single leg **106** by means of a single leg termination **108** of the long-radius-curve type (i.e., "dipleg **106** is provided with sealing means such as a trickle valve or flapper valve **108** or the like; column 4, lines 48-51).

Instant claim 1 structurally reads on the apparatus of Baumann et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191) in view of Danielsen et al. (U.S. 4,996,028).

Jones is silent as to the specifically recited ratio of radius of curvature-to-diameter for bend **20** (FIG. 1-3). Danielsen et al. teaches that it is important to maintain "a predetermined radius of curvature sufficient to increase, under condition of use, the stability of the dipleg solids level over that of a trickle valves having a straight run tubular body portion," and "the radius of curvature of the tubular body portion **25** preferably is in the range of from *about 1 1/2 times to about 2 1/2 times* the diameter of the tubular body portion **25**." (with emphasis added; column 3, lines 2-10; FIG. 1-2). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a ratio of 1.0 to 3.0 for the radius of curvature-to-diameter in the apparatus of Jones, for the reasons set forth by Danielsen, and since numerical ranges that overlap prior art ranges are obvious. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re*

Nehrenberg 126 USPQ 383 (CCPA 1960). In any event, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233.*

9. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191) in view of Luckenbach (U.S. 4,074,691).

Regarding claim 4, although Jones is silent as to bend **20** (FIG. 1-3) being constructed from a succession of straight tube sections arranged in an arcuate array, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such a construction for the bend in the apparatus of Jones, since substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). To evidence the conventionally of such structure, Luckenbach (FIG. 1) teaches a cyclone comprising a trickle valve **10** constructed of a pair of interconnected angularly disposed conduit members **12** and **14**, the upper one of which is lineal and connected with the lower vertical portion of the cyclone dipleg **16**.

Regarding claim 5, as seen in the Figure 2, the bend **20** of dipleg **16** *inherently* directs the flow of descending mass of solids into a plane orthogonal to the ascending gaseous flow, by virtue of the total angle subtended by the bend **20**.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (U.S. 2,634,191).

Jones only illustrates the configuration of "cyclones in series, or series-parallel... with individual diplegs," (column 1, lines 46-48; FIG. 1). However, if accordingly modified to

comprise the disclosed, "cyclones in multiple... discharging solids into a common dip-leg," (column 1, lines 32-46), the discharge end (defined by plate **19**) of the dipleg **16** would *inherently* lie on the side opposite the junction of the primary and secondary cyclone diplegs **16** and **11**, respectively. Additionally, the junction would inherently be located at a higher elevation than the discharge end. Although Jones is silent as to the vertical distance between the junction and discharge end, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate distance (such as the recited range) between the junction and the discharge end in the apparatus of Jones, on the basis of suitability for the intended use and absent showing any unexpected results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*.

11. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (U.S. 3,353,925).

Regarding claim 3, although Baumann et al. are silent as to the specific ratio of radius/diameter being within the range of 1.0 to 3.0, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate ratio for the apparatus of Baumann et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*.

Regarding claim 6, Baumann et al. discloses the junction of the leg **106** of the primary cyclone **104** and the leg **122/132** of the secondary cyclone **118/128** lies on the side opposite of

the discharge end **108** of the single dipleg **106** and at an elevation that is higher than the discharge end **108**. However, Baumann et al. are silent as to the specifically recited distance between the junction and discharge end. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate distance (such as the recited range) between the junction and the discharge end in the apparatus of Baumann et al., on the basis of suitability for the intended use and absent showing any unexpected results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (U.S. 3,353,925) in view of view of Luckenbach (U.S. 4,074,691).

Regarding claim 4, Baumann et al. is silent as to said termination **108** being constructed from a succession of straight tube sections in an arcuate array. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such a construction for the discharge means **108** in the apparatus of Baumann et al., for the reasons taught by Luckenbach above (the same comments apply). Additionally, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claim 5, as disclosed by illustration in FIG. 1, the discharge means **108** of dipleg **106** will *inherently* direct the descending mass flow of dense phase solids into a plane orthogonal to the ascending gaseous flow.

13. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crosby (U.S. 2,895,907) in view of Danielsen et al. (U.S. 4,996,028).

Regarding claims 1-3, Crosby (FIG. 1; column 3, lines 13-47) discloses a system which joins the lower end of the leg of a secondary **14** cyclone and a leg of a primary cyclone **13** to form a single primary and secondary cyclone leg complex **19/20** where the solids collected by both cyclones are combined, characterized by the combined solids being simultaneously discharged from the single leg **20** which is immersed below level **6** of the fluidized bed. However, Crosby is silent as to the specifically recited single leg termination of the "long-radius-curve type". Danielsen teaches a dipleg having a termination of the "long-radius-curve type", and further teaches that it is important to maintain "a predetermined radius of curvature sufficient to increase, under condition of use, the stability of the dipleg solids level over that of a trickle valves having a straight run tubular body portion," and "the radius of curvature of the tubular body portion **25** preferably is in the range of from about 1 1/2 times to about 2 1/2 times the diameter of the tubular body portion **25**." (column 3, lines 2-10; FIG. 1-2). Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute the dipleg having a termination of the "long-radius-curve-type" as taught by Danielsen et al. for the single leg **20** of Crosby, for the reasons recited by Danielsen et al. above.

14. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crosby (U.S. 2,895,907) in view of Danielsen et al. (U.S. 4,996,028), as applied to claim 1 above, and further in view of Luckenbach (U.S. 4,074,691).

Regarding claims 4 and 5, the collective teachings of Crosby and Danielsen are silent as to the dipleg termination being constructed from a succession of straight tube sections in an

arcuate array, whereby the descending mass of dense phase solids flow into a plane orthogonal to the ascending gaseous flow. In any event, it would have been an obvious design choice for one of ordinary skill in the art to select such a construction for the dipleg termination in the modified apparatus of Crosby, on the basis of suitability for the intended use and absent showing any unexpected results thereof, for the reasons taught by Luckenbach above (the same comments apply). Additionally, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
October 2, 2003 JAL

Hien Tran

HIEN TRAN
PRIMARY EXAMINER